

each chamber extending from pole to pole, and each layer covered with a cortical tubular reticulation.

Largest size.—Length $\frac{11}{48}$ inch; thickness $\frac{10}{48}$ inch.

Loc. Valley of Kelat (Dr. Cook).

Associates.—Found in the bed of diminutive Foraminifera mentioned under the head of *N. kelatensis*.

Obs.—The *Alveolina* (*A. Boscii*) described and illustrated by Dr. Carpenter (Phil. Trans. 1854) is classed by him with *Orbitolites*, or D'Orbigny's "Cyclostègues." That which I have described under the name of *A. elliptica* must be classed with *Nummulites* or the "Hélicostègues" of D'Orbigny. It begins spirally from a central cell like *Operculina*, &c. (*d*), and as the chambers increase, so they become extended vertically on both sides, but go beyond the sigmoid form of the chambers of *A. elliptica* in becoming tortuous; so that the surface of the test presents the wavy appearance of the surface of *Nummulites gyzezensis* when the superficial incrustation is dissolved or rubbed off (*a*). A canal-system (*e* 1, *f* 2, 3) can also be easily perceived at the commencement, which follows the margin or surface of the spiral lamina and the interseptal spaces respectively, assuming a reticulated structure in the former (*e* 1, *f* 2), supported on a series of straight canals (*f* 3) in the latter, which seem respectively, also, to answer to the horizontal and interseptal canals in *A. elliptica*, and to the marginal plexus and interseptal canals in *Operculina* and *Nummulites*.

[To be continued.]

XXXVIII.—*A Preliminary Synopsis of the Labroid Genera.*

By Dr. ALBERT GÜNTHER.

DURING my examination of the Labroid fishes, I have found it necessary to propose a more natural arrangement of the genera of that family. As the alterations suggested affect the greater number of the genera which had been previously established, I have considered it useful to give an abstract from the manuscript of the fourth volume of the 'Catalogue of Fishes' before its publication, in order to assist others who may engage in similar investigations, or to receive from them better information. Too little attention has been hitherto paid to the number of the fin-rays in generic division: this character is very constant in the allied species, and begins to vary only where the number of rays is very great, as in *Labrus*. Out of the forty genera proposed, five, viz. *Semicossyphus*, *Pteragogus*, *Cirrhilabrus*, *Olistherops*, and *Malapterus*, I have not seen. The three latter, however, are so well described and figured, that no doubt re-

mains with regard to their generic value. *Pteragogus*, we hope, will be figured in the forthcoming work on the Mossambique fishes by Prof. Peters.

First Group: *Labrina*.

Dorsal fin many-rayed, composed of more than twenty rays, thirteen of which at least are spinous. All the teeth in the jaws are conical; no posterior canine tooth.

Temperate regions of the North Atlantic: only one species from the Caribbean Sea; another species from the coasts of Chile.

* *Anal spines three.*

1. *LABRUS* (*Labrus*, sp.; *Crenilabrus* et *Coricus*, Cuv.). Teeth in a single series; cheeks and opercles with imbricate scales; dorsal spines not prolonged. (*L. maculatus*, Bl.; *L. melops*, L.; *L. rostratus*, Bl., &c.)
2. *LACHNOLAIMUS*, Cuv. & Val. Teeth in a single series; cheeks and opercles with imbricate scales; anterior dorsal spines much produced. (*L. falcatus*, L.)
3. *TAUTOGA*, Mitch. (*Tautoga*, sp., Cuv. & Val.). Teeth in a double series; scales on the cheeks rudimentary, opercles naked. (*Tautoga onitis* = *Labrus onitis*, L. = *Tautoga nigra*, Mitch.)
4. *MALAPTERUS*, Cuv. & Val. Teeth in a single series; imbricate scales on the cheek; operculum with a series of scales along the lower margin, the rest of the opercular apparatus being naked. (*M. reticulatus*, Cuv. & Val.)
5. *CTENOLABRUS*, Cuv. & Val. Teeth of the jaws forming a band; cheeks and opercles scaly. (*C. rupestris*, L.; *C. burgall*, Schoepff, &c.)

** *Anal spines more than three.*

6. *ACANTHOLABRUS* (*Acantholabrus*, sp., Cuv. & Val.). Teeth of the jaws forming a band. (*A. Palloni*, Risso; *A. Couchii*, Cuv. & Val.)
7. *CENTROLABRUS* (*Acantholabrus*, sp., Cuv. & Val.). Teeth in a single series. (*C. exoletus*, L.; *C. trutta*, Lowe; *C. rome-ritus*, Val.)

Second Group: *Hypsigenina*.

Dorsal fin with twenty rays, thirteen of which are spinous. The lateral teeth are more or less confluent into an obtuse osseous ridge, whilst the anterior remain free, conical.

From the Chinese seas to the coasts of Australia.

8. *HYPSIGENYS* (*Cossyphus*, sp., Cuv. & Val., Bleek.; *Creni-*

labrus, sp., Bleek.). Four canine teeth anteriorly in each jaw; scales on the cheek very small; operculum scaly. (*H. macrodon*, Lacép.; *H. ommopterus*, Richards.; *H. (Labrus) japonicus*, Cuv. & Val., &c.)

Third Group: Julidina.

Dorsal fin with less than thirteen spines; anterior teeth free, conical, compressed in *Anampses* only, the lateral sometimes more or less confluent into a ridge; teeth of the lower pharyngeal not confluent, or pavement-like.

Seas of the tropics, single species extending into the temperate regions.

* Eleven or twelve (ten) dorsal spines; lateral line not interrupted; cheeks and opercles scaly.

9. *XIPHOCHILUS*, Bleek. The membrane of the soft dorsal without scales; both limbs of the præoperculum scaleless; four canine teeth anteriorly in each jaw; lateral teeth more or less confluent into an obtuse osseous ridge; a posterior canine tooth. (*X. typus*, Bleek.)
10. *SEMICOSSYPHUS* (*Cossyphus*, sp., Cuv. & Val., Bleek.). The membrane of the soft dorsal without scales; both limbs of the præoperculum scaleless; four canine teeth anteriorly in each jaw; lateral teeth more or less confluent into an obtuse osseous ridge; no posterior canine tooth. (*S. reticulatus*, Cuv. & Val.; *S. (Labrus) pulcher*, Ayres.)
11. *DECODON* (*Cossyphus*, sp., Poey). The membrane of the soft dorsal without scales; the scales on the cheeks extend over the lower præopercular limb, the posterior being naked and serrated; four canine teeth anteriorly in each jaw; lateral teeth not confluent; a posterior canine tooth. (*D. puellaris*, Poey.)
12. *PTERAGOGUS*, Peters*. Base of the dorsal fin scaly; the posterior limb of the præoperculum serrated; scales large (L. lat. 25). D. $\frac{10-11}{11-10}$. A. $\frac{3}{10}$. (*P. opercularis*, Pet.; *P. taniops*, Pet.)
13. *COSSYPHUS* (*Cossyphus*, sp., Cuv. & Val.). The membrane of the soft dorsal is scaly at the base; scales of moderate size (l. lat. 30-36). Teeth in the jaws well developed; a posterior canine tooth. D. $\frac{12}{9}$. A. $\frac{3}{12}$. (*C. mesothorax*, Bl.; *C. axillaris*, Benn.; *C. macrurus*, Lacép.; *C. (Crenilabrus) an-*

* Not having had an opportunity of examining the species of this genus, we do not feel quite confident that the base of the dorsal fin is really scaly. If the scales at the base of the fin are merely the enlarged scales of the uppermost series of the back, without adhering to the membrane of the fin, this genus and the preceding should, perhaps, be united.

thioides, Benn. = *C. zosterophorus*, Bleek.; *C. rufus*, L. = *C. bodianus*, Cuv. & Val., &c.)

14. CLEPTICUS, Cuv. & Val. The soft dorsal is enveloped in scales; teeth in the jaws very small; no posterior canine tooth. (*C. genizara*, Cuv. & Val.)

** Nine dorsal spines; lateral line not interrupted; cheeks and opercles scaly.

15. DUYMÆRIA, Bleek. Præoperculum serrated; opercles and cheeks with large scales; teeth in the jaws in a single series. $D. \frac{9}{11-12}$. $A. \frac{3}{9}$. (*D. aurigaria*, Richards.; *D. (Ctenolabrus) flagellifera*, Cuv. & Val.; *D. (Cossyphus) filamentosa*, Pet.; *D. enneacantha*, Bleek., &c.)

16. LABRICHTHYS, Bleek. (*Labrus*, sp., Cuv. & Val., Richards.; *Tautoga*, sp., and *Julis*, sp., Richards.) Præoperculum not serrated; opercles scaly, cheeks more or less scaly; scales large; teeth in the jaws in a single series. $D. \frac{9}{11}$. $A. \frac{3}{10}$. (*L. celidotus*, Forst. = *Labrus pæcilopleurus*, Cuv. & Val.; *L. rubiginosus*, Schleg.; *L. (Labrus) laticlavus*, Richards.; *L. (Tautoga) luculentus*, Richards.; *L. cyanotænius*, Bleek.; *L. (Tautoga) tetricus*, Richards., &c.)

17. LABROIDES, Bleek. (*Labrus*, sp., Rüpp.; *Cossyphus*, sp., Cuv. & Val.) Præoperculum not serrated; opercles and cheeks scaly; scales of moderate size; teeth in the jaws minute, forming a band; a pair of curved erect canines in each jaw*. (*L. dimidiatus*, Cuv. & Val.; *L. xanthurus*, Bleek.; *L. quadrilineatus*, Rüpp., &c.)

*** Nine to eleven dorsal spines; lateral line interrupted; cheeks and opercles scaly.

18. CIRRHILABRUS, Schleg. (*Cheilinoides*, Bleek.) Eleven dorsal spines; præoperculum serrated; teeth in several series anteriorly; scales on the cheek small, in several series. (*C. Temminckii*, Bleek.; *C. cyanopleurus*, Bleek.; *C. solorensis*, Bleek.)

19. DORATONOTUS, Gthr. Nine dorsal spines; teeth in a single series; a posterior canine tooth; the middle of the spinous dorsal is strongly depressed; scales very large†. (*D. megalēpis*, Gthr.)

20. CHEILINUS, Cuv. Nine or ten dorsal spines; teeth in a

* The gill-membrane is attached to the isthmus in *L. quadrilineatus*; this would be another important character for that genus, if it should be found in the other species.

† The specimen on which this genus has been founded is not in a good state of preservation, and the scales on the head have been rubbed off, if they were present.

single series, each jaw anteriorly with one pair of canines, the lower pair received between the teeth of the upper; no posterior canine tooth; dorsal spines subequal in height; scales large; cheek with two series of large scales; lower jaw not produced backwards. (*Ch. chlorurus*, Bl.; *Ch. lunulatus*, Forsk.; *Ch. diagramma*, Lacép. &c.).

21. **EPIBULUS**, Cuv. Nine dorsal spines; scales very large; the lower jaw much produced backwards. (*E. insidiator*, Pall.)

**** *Eight or nine dorsal spines; head entirely naked or with only a few very small scales, either on the cheek or on the operculum.*

22. **ANAMPSSES**, Cuv. Dorsal spines nine; head entirely naked; scales of moderate size; lateral line continuous; each jaw with two compressed teeth anteriorly, the lower of which are received between the upper ones. (*A. cæruleo-punctatus*, Rüpp.; *A. geographicus*, Cuv. & Val., &c.)

23. **HEMIGYMNUS** (*Halichæres*, sp., Rüpp.; *Tautoga*, sp., Cuv. & Val., Bleek.). Dorsal spines nine; opercles naked, cheek with a strip of very small scales; scales of moderate size; lateral line continuous; each jaw with two conical canines anteriorly, the lower of which are received between the upper ones. (*H. (Mullus) fasciatus*, Thunb.; *H. (Labrus) melapterus*, Bl.; *H. notophthalmus*, Bleek.; *H. leucomos*, Bleek., &c.)

24. **STETHOJULIS** (*Julis*, sp., Cuv. & Val.; *Halichæres*, sp., Bleek.; *Halichoeres*, Kner). Dorsal spines nine; head entirely naked; scales rather large, those in the thoracic region as large as, or larger than, those on the side of the body; lateral line continuous; a posterior canine tooth. (*St. strigiventer*, Benn.*; *St. trilineata*=*Labrus trilineatus*, part., Bl. Sehn. = *Julis sebanus*, Cuv. & Val. = *Halichoeres Casturi*, Bleek.; *St. albovittata*=*Labrus albovittatus*, Bonnat. = *Julis balteatus*, Quoy & Gaim.; *St. interrupta*, Bleek.; *St. bandanensis*, Bleek.)

25. **HALICHÆRES** (*Halichæres*, sp., Rüpp., Bleek.; *Julis*, sp., Cuv. & Val., Kner, not *Halichæres*, Kner). Dorsal spines nine; head entirely naked; scales of moderate size, those in the thoracic region smaller than those on the side of the body; lateral line continuous; anterior teeth conical; a posterior canine tooth. (*H. Dussumieri*, Cuv. & Val. = *J. exornatus*, Richards. = *H. notophthalmus*, Bleek.; *H. hortulanus*, Lacép.; *H. melanurus*, Bleek.; *H. miniatus*, Kuhl & v. Hass.; *H. Argus*, Benn.; *H. Bleekeri*, Gthr = *J. Cuvieri*, Bleek.; *H. Cali-*

* In all the eight specimens examined by me, the posterior canine tooth is as distinct as in its congeners.

fornicus, Gthr = *J. modestus*, Girard ; *H. cyanostigma*, Cuv. & Val. ; *H. pyrrhogramma*, Schleg., &c.*).

26. **NOVACULA** (*Xyrichthys*, sp., et *Novacula*, Cuv. & Val. ; *Xyrichthys* et *Novacula*, sp., Bleek. ; *Novacula*, sp., Steindachner). Dorsal spines nine, the two anterior of which are sometimes remote from the others ; head entirely naked or with a patch of small scales on the cheek ; scales of moderate size ; lateral line interrupted ; head elevated, with the anterior profile parabolic. (*N. cultrata*, Cuv. & Val. ; *N. uniocellata*, Spix ; *N. taniura*, Lacép. ; *N. macrolepidota*, Bl. ; *N. pavo*, Cuv. & Val. ; *N. pentadactyla*, L. ; *N. bimaculata*, Rüpp. ; *N. argenti-maculata*, Steind., &c.)
27. **JULIS** (*Julis*, sp., Rüpp., Cuv. & Val., Bleek., Kner). Dorsal spines eight ; head entirely naked ; snout of moderate extent ; scales of moderate size ; lateral line continuous ; no posterior canine tooth. (*J. trilobata*, Lacép. ; *J. pavo*, Hasselq. ; *J. bifasciata*, Bl. ; *J. lunaris*, L. ; *J. melanocheir*, Bleek. ; *J. dorsalis*, Q. & G. ; *J. cupido*, Schleg. ; *J. umbrostigma*, Rüpp. = *J. Souleyetii*, Cuv. & Val., &c.)
28. **GOMPHOSUS**, Lacép. Dorsal spines eight ; head entirely naked ; snout much produced ; scales of moderate size, lateral line continuous ; no posterior canine tooth. (*G. cæruleus*, Lacép., &c.)
29. **CHEILIO**, Commers. Dorsal spines nine, flexible ; cheeks naked, operculum with a single series of very small scales ; scales of moderate size, lateral line continuous ; body elongate ; head low. (*Ch. inermis*, Forsk.)
30. **CORIS** (*Coris*, Lacép. ; *Hologymnosus*, Lacép. ; *Halichæres*, sp., Rüpp., Bleek. ; *Julis*, sp., Cuv. & Val., Bleek., Kner). Dorsal spines nine ; head entirely naked ; scales small, lateral line continuous. (*C. mediterranea*, Risso = *Labrus gulis*, L. = *J. vulgaris*, Flem. ; *C. Giofredi*, Risso ; *C. aygula*, Lacép. ; *C. (Labrus) annulata*, Lacép. ; *C. Cuvieri*, Benn. = *J. stellata*, Cuv. & Val. ; *C. Gaimardi*, Q. & G. ; *C. (Labrus) formosa*, Benn. ; *C. pulcherrima*, Gthr = *Julis formosus*, Bleek. ; *C. auricularis*, Cuv. & Val. ; *C. flavovittata*, Benn. = *J. Eydouxii*, Cuv. & Val. ; *C. heteroptera*, Bleek. ; *C. variegata*, Rüpp. ; *C. Greenoughii* = *J. Greenovii*, Benn. = *J. leucorhynchus*, Bleek.)
31. **CYMOLUTES** (*Julis*, sp., et *Xyrichthys*, sp., Cuv. & Val. ; *Novacula*, sp., Bleek., Steindach.). Dorsal spines nine ; head entirely naked, or with a small patch of rudimentary scales on the cheek ; scales small, lateral line interrupted. (*C. (Julis) pratextatus*, Q. & G. ; *C. microlepidotus*, Cuv. & Val.)

* More than seventy species.

Fourth Group: *Pseudodacina*.

Each jaw armed with two pairs of broad incisors and with a cutting lateral edge; teeth of the lower pharyngeal confluent, pavement-like.

East Indian Archipelago.

32. *PSEUDODAX*, Bleek. (*Odax*, sp., Cuv. & Val.) Eleven dorsal spines; scales of moderate size, lateral line continuous; cheeks and opercles scaly. (*P. moluccanus*, Cuv. & Val.)

Fifth Group: *Scarina*.

The teeth in both jaws are intimately soldered together into a broad convex cutting lamina, and become sometimes entirely indistinct; pharyngeal teeth pavement-like. Scales rather large. From eight to ten dorsal spines*.

Seas of the tropics; single species extending into the temperate regions.

33. *SCARUS* (*Scarus*, sp., Forsk., Cuv. & Val.; *Scarus*, Bleek.). Cheek with a single series of scales; the dentigerous plate of the lower pharyngeal broader than long; upper lip double in its whole circuit; dorsal spines pungent.
34. *SCARICHTHYS*, Bleek. (*Scarus*, sp., Cuv. & Val.) Cheek with a single series of scales; the dentigerous plate of the lower pharyngeal broader than long; upper lip double in its whole circuit; dorsal spines flexible.
35. *CALLYODON* (*Callyodon*, sp., Gronov., Cuv. & Val.; *Callyodon*, Bleek.). Cheek with a single series of scales; the dentigerous plate of the lower pharyngeal broader than long; upper lip double only posteriorly; jaws with distinct oblong imbricate teeth anteriorly.
36. *CALLYDONTICHTHYS*, Bleek. Cheek with a single series of scales; the dentigerous plate of the lower pharyngeal broader than long; upper lip double only posteriorly; teeth of the lower jaw distinct, disposed in oblique series. Dorsal spines stout.
37. *PSEUDOSCARUS*, Bleek. (*Scarus*, sp., Forsk., Cuv. & Val.) From two to four series of scales on the cheek; the dentigerous plate of the lower pharyngeal longer than broad; upper lip double only posteriorly; dorsal spines flexible.

Sixth Group: *Odacina*.

The edge of each jaw is sharp, cutting, without distinct teeth

* The genera of this group having been lately worked out by Dr. von Bleeker, we repeat shortly the diagnoses given by him.

anteriorly; pharyngeal teeth pavement-like. Scales small or rather small. Dorsal spines numerous, flexible.

Coasts of Australia and of New Zealand.

38. ODAX (*Odax*, sp., Cuv. & Val.). Checks and opercles scaly; snout conical, but with the upper jaw not produced. (*O. pullus*, Forsk.; *O. semifasciatus*, Cuv. & Val.; *O. radiatus* = *Malacanthus radiatus*, Q. & G. = *Cheilio lineatus*, Cuv. & Val.)

39. OLISTHEROPS, Richards. Head naked. (*O. cyanomelas*, Richards.)

40. SIPHOGNATHUS, Richards. Checks and opercles scaly; snout very long; upper jaw terminating in a pointed appendage. (*S. argyrophanes*, Richards.)

XXXIX.—On the History of the 'Maté' Plant, and the different Species of *Ilex* employed in the Preparation of the 'Yerba de Maté,' or Paraguay Tea. By JOHN MIERS, F.R.S., F.L.S.&c.

[Continued from p. 228.]

The note in M. Bonpland's handwriting, accompanying the specimens sent by him, is as follows:—

"No. 596. Herbe du Paraguay—Maté—*Ilex theæsans*, Bonpland—*Ilex Paraguayensis*, St.-Hilaire. Se trouve dans le Paraguay, le Brésil, et Entre Rios.

"No. 2425. *Caúna* des Brésiliens—*Ilex ovalifolia*, Bonpl., nouv. espèce. Se trouve dans le Faxinal, au sortir de la Picada de S^a Cruz, à 4 lieues du Rio Pardo.

"No. 2333. *Caúna* des Brésiliens—*Caachiriri* ou *Caachiri* des Guaranís—*Ilex amara*, Bonpl., n. esp. Se trouve dans les montagnes de S^a Cruz et dans les forêts du Paraná.

"No. 2332. *Caúna* des Brésiliens—*Caachiriri* des Guaranís—*Ilex crepitans*, Bonpl., n. esp. Se trouve dans les bois de Guayaraça dans le cœur de S^a Cruz et sur les bords du Paraná.

"No. 2330. *Caúna de folha larga* des Brésiliens.

"No. 2374. *Caúna amarga* des Brésiliens.

"No. 2479. *Caúna* des Guaranís—*Ilex gigantea*, Bonpl., n. esp. Se trouve dans les bois de S^a Cruz et sur les bords du Paraná.

"No. 2471. *Caunina* des Brésiliens—*Ilex Humboldtiana*, Bonpl., n. esp. Se trouve dans le Picada de S^a Cruz qui conduit à Rio Pardo, Prov. Rio Grande, Brésil.

"Toutes ces espèces d'*Ilex* sont employées à faire de l'herbe Maté. Les nos. d'ordre correspondent à mon journal botanique.

"Corrientes, 17 Juin, 1857."

"AIMÉ BONPLAND."

When in Paris three years ago, I endeavoured to ascertain whether any of these specimens agreed with St.-Hilaire's typical plant; but the latter, unfortunately, had been mislaid or lost in the removal of the collections exhibited in the great 'Exposi-